SELLING BLACK WALNUT TIMBER

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BLACK WALNUT is a million-dollar timber crop that comes not from extensive forests but from scattered single trees or small groups of trees on farms in 33 States. To make money for its producers it must be cut and marketed intelligently. The farmer must have some knowledge of logging, timber appraising, log scaling, and marketing if he is to realize a profitable return on this valuable farm crop. The purpose of this bulletin is to give him the information he needs, briefly and without technicalities.

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COVER ILLUSTRATION.—Measuring a black walnut tree. This fine example of black walnut, 23 inches in diameter at breast height, is being measured by walnut buyers preparatory to submitting a bid to the walnut pool in which it was included.

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SELLING BLACK WALNUT TIMBER

By Warren D. Brush, *scientific assistant, Forest Service* [1]

Contents

BLACK WALNUT AS A FARM CROP

Black walnut (*Juglans nigra* L.) grows best on agricultural lands, and manufacturers of walnut lumber and veneers depend on the farmers for their supplies of logs. Foresters and 4–H Clubs are encouraging the planting of black walnut to meet future demands.

In Ohio, Indiana, Illinois, Kentucky, Tennessee, Missouri, Iowa, and 26 other States (fig. 1) walnut grows naturally on farm land and in most cases can yield the farmer a good return if properly marketed. Farmers in these States annually sell millions of board feet of walnut either in standing trees or as logs, which adds a substantial sum to the farming income.

Manufacturers want black walnut because of qualities no other wood has in the same combination. It is readily worked with tools. It holds its shape in seasoning. If properly dried before fabrication, it shrinks, swells, and warps very little in the finished product. It takes a good finish, and when finished has a very attractive appearance.

Black walnut trees bring higher average prices than any other kind of timber grown on the farm, and the general trend of these prices has been upward since 1915. Walnut is primarily a good wood for cabinetwork and furniture making of all kinds. In both World Wars it was in great demand for gunstocks.

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[1] Dr. Brush retired from the Forest Service in 1945. This revision was prepared in 1947 by Anne E. Williams, editor, Chief's Office, with technical assistance of the Central States Forest Experiment Station and the Division of Forest Management Research, Chief's Office, Forest Service, and of Arthur M. Sowder, Extension Service, U. S. Department of Agriculture, in collaboration with State extension foresters in Illinois, Nebraska, Kansas, Missouri, and the Agricultural Experiment Station, La Fayette, Ind.

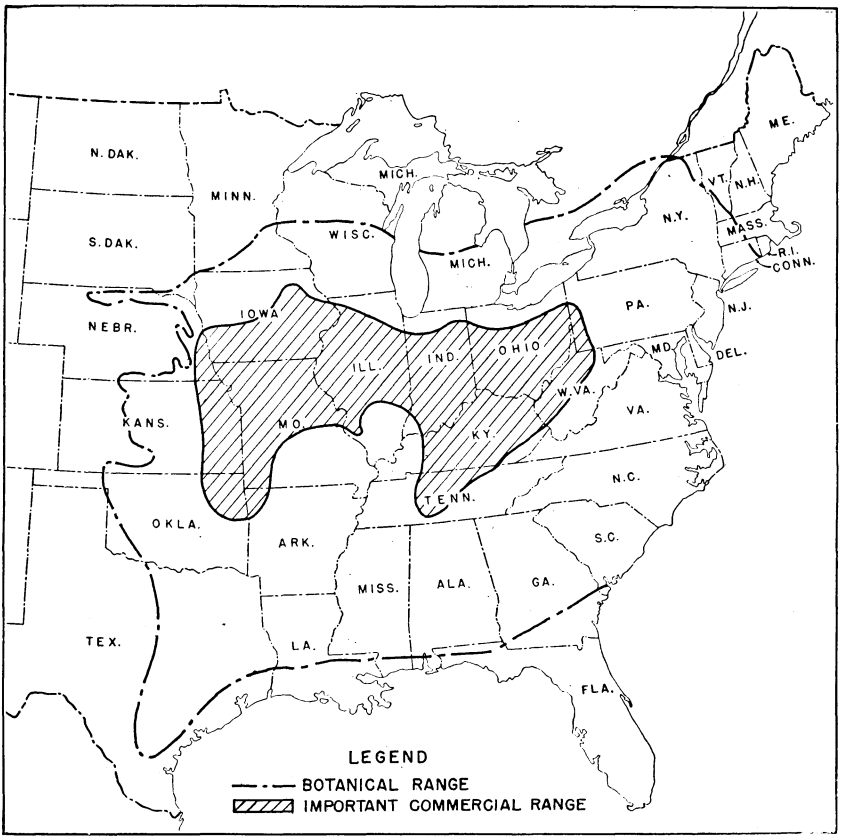

FIGURE 1.—Range of black walnut (*Juglans nigra*).

PRACTICAL SUGGESTIONS ON SELLING

In order to dispose of his timber to good advantage the walnut owner needs to know something of how to appraise and scale his logs, and how to cut and market them. With regard to the actual selling of his timber, the things he must know are: (1) The sizes and grades of walnut logs for which the buyer will pay highest prices; (2) how his crop grades and how much it amounts to; (3) how to reach the best market; (4) how to sell to the best advantage; (5) what prices his timber should bring.

Before attempting any estimate of the value of his timber, the farmer should inspect his trees carefully, determine which trees he will sell, and mark them. The requirements of buyers and the principles of good forestry[2] should be considered in making the selections. The market specifications for logs should be met. No cutting of black walnut trees should be done until a satisfactory market is obtained.

Some buyers accept logs as small as 12 inches in diameter but it usually is not advisable to cut trees as soon as they reach this size. The larger trees bring better prices. Thrifty trees of good shape and

[2] Some principles of good forestry that can be applied to black walnut are given in U. S. Dept. Agr. Farmers' Bulletin 1989, "Managing the Small Forest."

quality should be left to continue their growth until at least 20 inches in diameter at breast height. Occasionally, small trees need to be removed, such as trees with defects (stump rot, large knots, crooked trunks, double heart, etc.), trees making poor growth or crowding trees of better quality. The State forester or extension forester will help the farmer select the trees that should be removed.

Grading rules are used to sort logs into quality classes according to their value for lumber and veneer. The number and kinds of defects, size of the logs, and their location in the tree determines the log grade. The lowest grade may be quite defective, but most yield some good lumber.

GRADING RULES OF THE AMERICAN WALNUT MANUFACTURERS' ASSOCIATION

Most buyers of black walnut logs use the grading rules of the American Walnut Manufacturers' Association for the grading, inspection, and measurement of walnut logs. These rules are given here as they have been published by the association.

Log Grades

Prime logs are butt logs only, fresh cut from live timber, sound, straight, and free of all defects and excessive sapwood. Logs are to be 12 inches and larger at the small end; must run 8 feet and longer, except that clear butt logs 6 and 7 feet long, if 16 inches and larger in diameter, may be graded as prime.

Select logs will admit: (*a*) Butt logs 16 inches and up, 8 feet and longer; must have three clear faces; no unsound defects admitted. (*b*) Second cuts 16 inches and up, 8 feet and longer, clear of all defects. (*c*) Logs prime, except for slight crook.

A log showing iron or other extraneous metal shall in no case be graded higher than Select.

No. 2 logs will admit: (*a*) Logs 12 inches and up, 8 feet and longer. Must have two clear faces or better. (*b*) Clear logs 12 to 15 inches and 6 to 7 feet. (*c*) Any log 6 to 7 feet, 16 inches and up, with three faces clear or better.

Cull logs.—All logs which will not meet above specifications are cull logs.

Exceptions: Logs with worm holes, ring shake, bird peck, or bark growth have no classification.

Inspection

In general, logs shall be graded as found. The inspector may, however, actually dock the length of measure of a log, provided it is for improving the grade only and that dockage does not exceed 25 percent of the length of the log. Logs must be piled so they can be rolled over and all sides inspected.

Defects

All of the following are defects and must be considered as such: Knots, worms, catfaces or blind knots, splits, dote, double hearts, crooks, shakes, iron or wire, ring hearts, frost cracks, splinter pulls, lightning streaks, ingrown bark, and bird pecks.

Measurement

Measurement to be taken at small end, inside bark, average diameter, Doyle's Rule as given in Scribner's log book to apply.

Allowance to be made for abnormal swells caused by double hearts. All logs must be cut 2 inches or more over in length to allow for end-checking and equalizing.

OTHER GRADING RULES

Other log-grading rules are used by some firms that deal in black walnut logs. Some are only variations of the Association rules and names and numbers of grades may vary. The best grade is called "veneer" in some rules. Acceptance of one standard set of rules by all would remove much confusion and benefit all concerned, though interpretation and application of the rules would still vary with the individual buyer.

Some firms make a deduction in measurement for holes and decay instead of placing the logs in a lower grade. The general character of the log must be very good, however, to allow its admission into the better grade with such a deduction.

WALNUT STUMP GRADES

Black walnut stumps are used in the manufacture of veneer. To be valuable a stump must have a wavy or irregular grain, called "figure," which is most often present in the wood at the curved portion at the base of the tree where the roots extend out from the trunk. This figure, if discernible in the standing tree, is generally indicated by irregular bark ridges or by a ridged surface under the bark (fig. 2).

FIGURE 2.—A "figured" stump. Bark removed to show the "nubbles" which indicate that a stump will produce figured veneer. Defects (frost cracks and rot) not visible in this picture caused this stump to be graded as poor. (Agricultural Experimental Station, Purdue University, La Fayette, Ind.)

FIGURE 3.—High-quality black walnut stump with log attached. (Agricultural Experiment Station, Purdue University, La Fayette, Ind.)

Since this figured condition is not easily determined, the decision as to whether a stump is figured must generally be left to the buyer. The number of stumps accepted by the buyer depends partly on the facilities of the company and the market demand.

Stumps are usually sold in the same way as logs, by the board foot, log scale, according to length and diameter inside bark at the small end. Most buyers prefer to have a stump attached to the butt log (fig. 3).

The grading rules for walnut stumps published by the American Walnut Manufacturers' Association are given in table 1.

TABLE 1.—*Minimum specifications for walnut stumps fresh cut from live timber*

Grade	Length (inches)	Minimum diameter when stump is—		Average height of figure when stump is—		Number of pieces allowed in entire stump	Intensity of figure (must be true stump figures.)
		Longer than 30 inches	24 to 30 inches long	Longer than 30 inches	24 to 30 inches long		
A	24 and up	22 inches and up.	22 inches and up.	⅔	¾	2 pieces; except those 23 inches and up may be 3 pieces.	Must be close, heavy, dense figure.
B	24 and up	18 inches and up.	20 inches and up.	½	⅔	2 pieces; except those 21 inches and up may be 3 pieces.	Must be heavy, close figure.
C	24 and up	18 inches and up.	18 inches and up.	⅓	½	2 pieces; except those 20 inches and up may be 3 pieces. Any stump under 20 inches having more than 3 pieces, must have "B" height of figure.	Medium to heavy stump figure permitted.

ESTIMATING STANDING TIMBER

There are several reasons why the owner of black walnut timber should determine as nearly as he can the amount of timber he has for sale.

1. He will know whether he has a sufficient quantity to warrant shipment of the logs.
2. He can get some idea of how much his timber should bring him.
3. He can tell prospective buyers about how much he has that is salable.
4. If the timber is sold standing, it will serve as a check against the buyer's estimate.

If the owner has not had previous experience in measuring and estimating timber, his results may be far from accurate. This is particularly true in regard to determining the value, for the price depends so largely on the nature of the defects present, some of which may not be noticeable until the tree is felled and cut into logs. Even a rough estimate, however, will be helpful and will enable him to deal with the buyer to better advantage.

In estimating timber it is necessary to determine the number of logs and the size of each that can be cut from the standing tree. Timber is commonly purchased on the board-foot basis, the number of board feet in any log depending on its length and its diameter. The walnut industry requires a deduction of 2 to 3 inches from the outside diameter for the bark. An allowance of 2 to 3 inches additional on the length of each log is necessary for cutting into log lengths in order to provide for trimming and equalizing.

Table 2 gives the number of board feet in logs of different sizes according to the Doyle log rule, which is the log rule commonly used in measuring black walnut timber. The Doyle rule, however, is known to be very inaccurate, particularly in the small diameters. In making use of the entire tree, there are bound to be some logs of small diameter, and the Doyle rule is therefore unfavorable to the seller of logs. The International rule gives values very close to the actual yield of the log when sawed into lumber. Its use in the sale of logs is advisable and should be encouraged.[3]

[3] The formula used in the Doyle rule is as follows: To determine the contents of a log deduct 4 from the diameter (in inches) of the small end, divide by 4, square the quotient, and multiply by the length of the log in feet. This log rule gives less than the actual amount of lumber that can be sawed from the smaller logs. For instance, a log 12 inches in diameter at the small end and 16 feet long scales 64 board feet by the Doyle rule, whereas approximately 100 board feet of lumber can be sawed from it; similarly, a log 16 inches in diameter, 16 feet long, scales 144 board feet, and it will yield about 180 board feet of lumber, as indicated in the following table:

Board-foot contents of 16-foot logs by Doyle rule and by International rule [1]

Top diameter inside bark (inches)	International	Doyle	Top diameter inside bark (inches)	International	Doyle	Top diameter inside bark (inches)	International	Doyle
	Bd. ft.	*Bd. ft.*		*Bd. ft.*	*Bd. ft.*		*Bd. ft.*	*Bd. ft.*
6	20	4	16	180	144	26	500	484
7	30	9	17	205	169	27	540	529
8	40	16	18	230	196	28	585	576
9	50	25	19	260	225	29	630	625
10	65	36	20	290	256	30	675	676
11	80	49	21	320	289	32	770	784
12	95	64	22	355	324	34	875	900
13	115	81	23	390	361	36	980	1,024
14	135	100	24	425	400	38	1,095	1,156
15	160	121	25	460	441	40	1,220	1,296

[1] For saws cutting a ¼-inch kerf.

TABLE 2.—*Board feet, log scale, contained in logs measured according to the Doyle log rule*

Diameter small end inside bark (inches)	Length in feet										
	6	7	8	9	10	11	12	13	14	15	16
	Bd. ft.	*Bd. ft.*	*Bd. ft.*	*Bd. ft.*	*Bd. ft.*	*Bd. ft.*	*Bd. ft.*	*Bd. ft.*	*Bd. ft.*	*Bd. ft.*	*Bd. ft.*
9	9	11	12	14	16	17	19	20	22	23	25
10	13	16	18	20	22	25	27	29	31	34	36
11	18	21	24	28	31	34	37	40	43	46	49
12	24	28	32	36	40	44	48	52	56	60	64
13	30	35	40	46	51	56	61	66	71	76	81
14	37	44	50	56	62	69	75	81	87	94	100
15	45	53	60	68	76	83	91	98	106	113	121
16	54	63	72	81	90	99	108	117	126	135	144
17	63	74	84	95	106	116	127	137	148	158	169
18	73	86	98	110	122	135	147	159	171	184	196
19	84	98	112	127	141	155	169	183	197	211	225
20	96	112	128	144	160	176	192	208	224	240	256
21	108	126	144	163	181	199	217	235	253	271	289
22	121	142	162	182	202	223	243	263	283	304	324
23	135	158	180	203	226	248	271	293	316	338	361
24	150	175	200	225	250	275	300	325	350	375	400
25	165	193	220	248	276	303	331	358	386	413	441
26	181	212	242	272	302	333	363	393	423	454	484
27	198	231	264	298	331	364	397	430	463	496	529
28	216	252	288	324	360	396	432	468	504	540	576
29	234	273	312	352	391	430	469	508	547	586	625
30	253	296	338	380	422	465	507	549	591	634	676
31	273	319	364	410	456	501	547	592	638	683	729
32	294	343	392	441	490	539	588	637	686	735	784
33	315	368	420	473	526	578	631	683	736	788	841
34	337	394	450	506	562	619	675	731	787	844	900
35	360	420	480	541	601	661	721	781	841	901	961
36	384	448	512	576	640	704	768	832	896	960	1,024
37	408	476	544	613	681	749	817	885	953	1,021	1,089
38	433	506	578	650	722	795	867	939	1,011	1,084	1,156
39	459	536	612	689	766	842	919	995	1,072	1,148	1,225
40	486	567	648	729	810	891	972	1,053	1,134	1,215	1,296

High quality of logs is of first importance. Log quality is determined by freedom from blemishes and defects, position in the tree, diameter, and length. Serious defects, such as knots, cause least depreciation in quality of the log if near the end of the log. Where it can be done, it pays to cut the log at the location of such a defect. How to cut the tree into log lengths is discussed more fully later in this bulletin.

It can be seen from table 2 that the number of board feet in a log increases greatly with an increase in diameter. There is less waste in sawing a large log than a small one, and often better use can be made of the wider boards. The lumber from the larger logs is therefore worth much more per thousand board feet. It follows that it is profitable to the seller to convert his trees into logs that have the largest possible diameter at the small end and at the same time meet the specifications for length and grade.

Lengths from 8 to 16 feet are usually called for in buyers' specifications, with a small proportion of logs 6 and 7 feet long. It is generally best, therefore, to cut the logs not over 12 feet in length, since in long logs the diameter at the small end is proportionately less, and it is this diameter that is used to compute the board-foot contents by the Doyle rule. In some cases, however, it will be necessary to cut logs longer in order to include all of the tree that is salable, or salable in the highest log grade. This is often the case with open-growth trees, which commonly yield only one log (fig. 4). Trees in groves usually have longer branch-free trunks because of shading by other trees.

The large tree at the left in figure 5 should yield one high-grade butt log and possibly one other high-grade log. The tree at the left

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FIGURE 4.—Open-growth type of black walnut.

of this one will yield one long log or possibly two short ones of good quality. The tree in the middle has one butt log of high quality and one log of a lower grade. The one at the extreme right will yield one small log of doubtful quality.

Some of these trees are being used to support the fence wire in the foreground. The buyer will place the butt logs in a lower grade if nails or staples have been driven into the wood. If nails or staples have been in the tree for a number of years so that they have become hidden by new wood growth, they are likely to damage the saws or veneer knives at the mill. Therefore a log from such a tree may be rejected entirely by the buyer.

Very defective logs are not merchantable, although some cull logs are. The general specifications given on page 3, and the forester or the buyer, should be consulted to determine what logs are acceptable.

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FIGURE 5.—Small grove of black walnut trees in pasture. Illinois.

In making an estimate of the timber it will be found convenient to make a list of all logs, showing the small-end diameter and the length of each log in each tree, with a space to be filled in later with the quantity of each log in board feet. The following list (table 3) shows how the log scale may be entered in this way. By classifying the different logs according to grade, their approximate value may be ascertained. If it is not desired to separate the logs into grades, the number of board feet may be entered in a single column. The scale of the stumps selected by the buyers can be entered in table 3 or a separate listing made for them. Table 4 gives the scale for walnut stumps.

TABLE 3.—*Method of entering logs*

Logs	Grade	Length (feet)	Diameter (inches)	Scale, board feet, by log grade			
				Prime	Select	No. 2	Cull
Tree No. 1:							
Butt log	Select	14	18		171		
Second log	No. 2	12	14			75	
Tree No. 2: Butt log	Select	16	13		81		
Tree No. 3:							
Butt log	Prime	12	20	192			
Second log	Select	10	12		40		

A rough valuation of the logs may be obtained by adding together the scale in board feet for each diameter class of each log grade and multiplying by the values obtained from a reliable walnut manufacturer or buyer. In preparing such a list of logs one should measure or

estimate the diameters and lengths carefully in order to obtain dependable results. Measure the diameter at about 4½ feet above the ground (diameter at breast height or d. b. h.), using a carpenter's square or a yardstick held perpendicular to the line of sight. (See cover photograph.) Subtract 2 or 3 inches for the bark. Most trees taper 1 to 2 inches for each 12 feet, so subtract 1 or more inches for taper in each 12-foot length. This will give the approximate inside diameter at the small end of each log.

TABLE 4.—*Scale for walnut stumps* [1]

Diameter (inches)	Lumber content when stump length is—			Diameter (inches)	Lumber content when stump length is—		
	24 in.	30 in.	36 in.		24 in.	30 in.	36 in.
	Bd. ft.	*Bd. ft.*	*Bd. ft.*		*Bd. ft.*	*Bd. ft.*	*Bd. ft.*
14	12	15	18	25	55	69	83
15	15	19	22	26	60	75	91
16	18	22	27	27	66	82	99
17	21	26	32	28	72	90	108
18	24	30	37	29	78	98	117
19	28	35	42	30	84	105	127
20	32	40	48	31	91	114	137
21	36	45	53	32	98	122	147
22	40	50	61	33	105	131	158
23	45	56	68	34	112	140	169
24	50	62	75				

[1] Data from American Walnut Manufacturers' Association.
BE SURE the tree has a stump figure and will grade "C" or better before you grub.

Although 12 inches at the small end is usually the smallest log size acceptable for lumber and 15 inches for veneer, the smaller logs, tops, and limbs may be salvaged for posts, poles, stakes, railroad ties, mine timbers, and other uses. The price paid for the small logs is considerably lower than for logs of lumber and veneer size and not all manufacturers are equipped to salvage all parts of the tree. It may be necessary to sell to more than one buyer to dispose of the entire lot, or some may be custom-sawed for farm use.

In addition to size and location in the tree, the following points help determine the grade of the logs: Decay, large knots, crooked trunks, and other visible defects. "Conks" or "punks" growing on a tree indicate decay. "Sound" each tree with a hand ax. If there is a hollow or drumlike sound the tree is probably hollow, rotten, or ring-shaken.

SCALING LOGS

It is, of course, much easier to determine the contents of the logs after they have been cut. The diameter at the small end inside the bark can then be measured accurately with a rule, as also the length. Before cutting the log into lengths the instructions given under "How to cut walnut trees" should be consulted.

Where the log is not round at the small end the usual method of measurement is to split the difference between the longest and shortest diameters taken at right angles to each other, as shown in figure 6. Since the long diameter in this case is 17 inches and the short diameter 15 inches, the diameter of the log is counted at 16 inches. If the log is 15 inches one way and 15½ inches the other, or if it is 15 inches one

way and 16 inches the other, it is counted as 15 inches; if 15½ one way and 16½ the other, it is counted as 16 inches.

If there is a bulge or growth so that the diameter of a log at the small end is noticeably larger than at other points throughout its length, it is customary to take the smallest diameter, as the amount of square-edged, log-length lumber that can be sawed from a log is determined by its smallest diameter.

Table 2, giving the amount in board feet, can be applied in the same way for logs as for standing timber.

Additional information on scaling logs and estimating standing timber will be found in Farmers' Bulletin 1210, United States Department of Agriculture, "Measuring and Marketing Farm Timber."

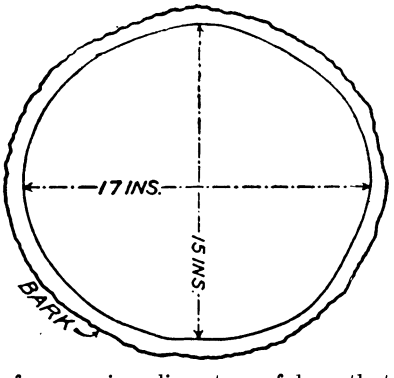

FIGURE 6.—Method of measuring diameters of logs that are not round. An average is taken of the long and short diameters measured at right angles to each other. In this instance the diameter is counted as 16 inches.

FINDING A MARKET

Before dealing with the log buyer, timber owners should prepare a statement concerning their timber, giving location, distance from highway and railroad, and amounts of different sizes and grades of logs as accurately as can be determined. A sample description follows. Estimated log diameters inside bark at small end are designated "d. i. b."

Timber ¼ mile from good road, 4 miles northeast of Jonesville, Brown County, Ind., 3½ miles by road from White's siding on Baltimore & Ohio R. R.

	Feet long		*Feet long*
Prime logs:		No. 2 logs:	
1 log 19 inches d. i. b.	10	1 log 14 inches d. i. b.	10
2 logs 16 inches d. i. b.	12	2 logs 14 inches d. i. b.	13
Select logs:		1 log 12 inches d. i. b.	10
2 logs 17 inches d. i. b.	14	Cull logs:	
4 logs 16 inches d. i. b.	12	2 logs 10 inches d. i. b.	12
1 log 16 inches d. i. b.	14		

This statement may be mailed to several firms that may be interested in purchasing the timber.

Where there is available a sufficient quantity of high-grade black walnut timber to interest the large walnut manufacturer, the farmer should deal directly with him or his representative. If he hasn't enough timber to interest the large mill, he may sell to the jobber who buys up walnut from farmers throughout the community and

sells to manufacturers of walnut lumber and veneer. Some of the large mills have local representatives who purchase logs for them whenever there is an opportunity. More often, the mills have regular salaried buyers who travel throughout the country districts, estimating, scaling, and buying. Where there is a sufficient quantity of walnut available, such buyers will make a special trip to estimate and make an offer on the timber. The prospective seller can obtain the services of a mill buyer by making a very rough estimate of the walnut available for sale in his vicinity and notifying the mills he addresses.

A large sawmill, with equipment to get the most out of the logs, may be able to pay more than a small sawmill. However, the increase in price may be offset by the increase in freight if the large mill is much farther away. A careful estimate of net returns should be made before deciding where to sell.

Although the railroads charge for a shipment according to weight, there is a fixed minimum charge for a carload, and therefore a small shipment of logs may carry an excessive freight cost. It is often worth while for two or more farmers to combine their logs in one car.

Thus, there are several advantages to be gained in marketing timber in large quantities: (1) Buyers can afford to give a better price where they handle a large quantity in one neighborhood; (2) there is more likelihood of interesting several buyers, and competition among them may result in higher prices; (3) the logs can be shipped in full carload lots, keeping the freight cost at the minimum.

Where several farmers in a neighborhood have marketable walnut they may join together to form a temporary organization for the purpose of selling their timber. The responsibility for starting such an organization may be assumed by one or more owners of walnut timber who are anxious to sell. These owners first get in touch with others who have timber to dispose of. The county agricultural agent can usually assist by getting up a list of those farmers who have walnut timber for sale. Owners may be asked to submit a list of their trees or logs, giving sizes and quality, for the purpose of determining the approximate amount of timber available.

The county agricultural agent may be able to help by calling a meeting of those farmers who have walnut timber and who are interested in selling it. Someone should assume the duty of collecting market information and presenting it to the group. Wherever an extension forester is available he could help by explaining the methods of handling walnut timber, the sizes and quality of logs for which there is a demand, and perhaps by suggesting plans for the disposal of the timber.

At the meeting an inventory should be made of the total amount of timber available. This information can be forwarded to walnut-log buyers in order to interest them to inspect the timber and make offers on it. The buyers' offers will be made on each parcel of timber as it stands, or cut into logs in the woods, or delivered at the railroad. If several farmers arrange to sell their timber at the railroad, the logs of each owner should be plainly marked and piled separately.

The farmers should arrange with someone who is familiar with the measuring and grading of logs to represent them at the time when the buyer makes his inspection. He should make a check scaling and grading of all of the logs, keeping a separate record for each owner.

METHODS OF SELLING

Two general forms of sale are usually open to the timber owner—a lump-sum offer and a price by the board foot.

Lump Sum

The lump sum or price for the entire lot of standing timber is often used to sell black walnut. It is the least trouble to the seller, as he does not have to do any measuring or estimating but takes what is offered. It gives the advantage to the buyer, who usually is better qualified than the owner to determine very closely the quantity and value of the timber. Farmers often have little idea of the worth of their timber. If no restrictions are agreed on, the buyer can take all the trees, large and small, in the lot, leaving none for future growth, and thus damaging or destroying the woodland. For the protection of the seller and of the woodland, the practice of selling by lump sum or price by the entire lot should be discouraged.

If, in spite of the disadvantages, the owner wants to sell his standing timber for a lump sum, he should estimate the approximate quantity and quality of his timber and obtain bids from several buyers. A written agreement from the buyer to cut only the marked trees, or a written stipulation to cut no trees below a certain diameter limit will serve to protect his woodland. Young, fast-growing, well-shaped trees should be left for a future crop. The trees to be harvested should be marked at about breast height, and also near the ground. This will leave a record on the stump and on the first log of each tree, and will prevent misunderstanding.

Board Foot

A common method is to sell the standing timber with the understanding that it will be paid for according to the log scale after it is felled and cut into log lengths. The price paid per thousand board feet usually varies with the diameters of the logs. This variation should be according to a fixed scale of prices which will specify the amount to be paid per thousand board feet for each diameter size or diameter class, and log grade. Prices may change rapidly, and to avoid later misunderstandings the seller should keep a record of the prices agreed upon.

When the logs are measured, in order to satisfy himself as to the correctness of the scale and to have a record to compare with his estimate, the owner may number each log and enter on a sheet of paper the diameter and length of each as recorded by the buyer. A thorough familiarity with the method of measuring logs, specifications, and prices for different sizes and grades will be of great help in selling the timber to good advantage.

The farmer may sometimes have several options in disposing of his black walnut: Standing, cut into log lengths on the ground, delivered at the railroad, or on board cars. In some instances, he will find it to his advantage to do the work of cutting, hauling, and loading on cars, if he has the necessary equipment and experience, for thereby he will get the extra price for his labor. He can also be sure the greatest care is used not to damage young trees, or to make trails that will encourage erosion of his land. This work may well be done during the winter or to times when other farm work is not

pressing. However, often the buyer prefers to do the cutting because he can get the most out of the tree. He knows how to cut it and he has the equipment. A valuable log or stump can be ruined by improper cutting.

Usually it is undesirable to sell walnut logs subject to inspection at the mill, and this is seldom done. Some logs may be worth little, perhaps not even their freight, and the seller may be badly disappointed in his returns if valuation is not made before shipping. The cull logs could be sawed locally into farm lumber.

A commendable plan of purchase is as follows:

An inspector is sent to measure the logs at the railroad right-of-way and as soon as they are measured a check made out to the seller is deposited in his bank. After the logs have been shipped, the railroad company's receipted bill of lading is delivered to the bank. The bank is then automatically authorized to turn the money over to the seller.

PRICES

The prices paid for black walnut logs vary widely, depending mainly on their quality, size, and location.[4] Logs at the mill naturally bring higher prices than logs in the woods or delivered at the railroad. There is considerable range in the prices at the mill quoted by different firms. This range is in part due to the fact that some firms require a somewhat better quality and larger size of logs than others. The equipment of the mill also influences the price. A mill that is able to utilize the most of the wood can afford to pay better prices than a poorly equipped mill which wastes more of the wood and cannot make as high quality products. In sections of the country where the logs run poorer in quality, firms must accept a poorer grade of logs and the price is correspondingly lower. Where the timber is scattered and far from the mill, the general tendency is also toward a lower price. Since transportation is a large item of cost, the value of standing timber will depend partly on the distance from the mill where it is to be converted into lumber or veneer.

Sound logs with special figure such as curly and wavy grain, especially big logs with such figure, should bring much higher prices than plain logs. The price depends very largely on the extent and quality of the figure. It is very difficult to be certain whether a log is figured. Even experienced buyers cannot always identify such logs.

Figured stumps also bring high prices, especially if very large, sound, and well figured. However, only those stumps are of special value that have a sufficient amount of the valuable crinkle or ripple-mark figure and can be converted into high-quality veneer. The determination of the value must be left largely to the log buyer.

The walnut burl is a peculiar growth which formerly was of great value for the manufacture of veneer. The burl generally has the appearance of a huge wart. The best ones are usually turnip-shaped, and typical specimens are covered with little conical spines. As a

[4] Former editions of this bulletin included tables showing price ranges for various sizes and log grades. Because of the present unsettled condition, similar tables are not included in this revision. It is suggested that reliable walnut manufacturers, county agricultural agents, farm foresters, State forest officials, or extension foresters be consulted for information concerning current local walnut log prices. Another source of such information is the Central States Forest Experiment Station of the Forest Service, Old Federal Bldg., Columbus 15, Ohio.

general thing only the so-called "root burls," which grow on the stump or root of the tree, are sound; those higher up on the trunk or on large limbs are generally full of cavities. Good burls have been found on the roots below the surface of the ground; they are very rare, however. Burls have generally been sold by weight. During the past 5 or 6 years there has been no market for burl and this state of the market may continue for an indefinite time.

HOW TO CUT BLACK WALNUT TREES TO BEST ADVANTAGE

LOGS

The quality and value of the log frequently can be increased by care in cutting the tree into log lengths after it is felled. The important thing to keep in mind is to cut the salable portion of each tree into such lengths that the total selling price will be a maximum, based on the log grade prices per thousand feet and the scaled volumes of the logs. Generally the logs should be cut at a crook, crotch, or knot wherever practicable, in order to get as straight and clear lengths as possible. For instance, the tree shown in figure 7 should be cut at the large knot which is about 10 feet above the ground. Another log can probably be obtained above this knot.

All logs are required to be cut at least 2 inches longer than the even foot; for instance, a log 9 feet long must measure at least 9 feet 2 inches. This is to allow for squaring the ends of the boards at the mill. Cutting the logs more than 4 to 6 inches over the even foot is wasteful to the seller because the extra length does not increase the log scale.

In felling the tree the cut should be made as near the ground as possible in order to get the advantage of the more valuable large-sized material. Where the stump is of value, the tree should be grubbed out as described in the next section. For this reason it pays to have the buyer look over the timber before it is felled so that he may indicate any stumps which may be of value.

Care should be exercised in felling walnut, especially if there is a large crotch, as the wood is inclined to split. If the crotch strikes the ground with considerable force it may split below the fork and extend a long distance into the large trunk, causing much loss.

One should avoid including extra length in logs that taper rapidly at the upper end, as this will reduce the scale of the log. This does not mean that it is always advisable to cut short logs. As already stated, firms generally specify that there shall be not more than a certain percentage of logs under certain lengths.

Some log buyers take the diameter measure of long logs (over 16 feet) at some specified distance from the small end. This method of measurement is commendable because, while avoiding loss from taper and corresponding loss in diameter, it takes full advantage of length of log.

The side on which the tree is to be felled should be deeply undercut, otherwise splinters are likely to be pulled out of the butt log, which lessens the value of that log. Buyers generally make the same deductions for logs with splinter pull as for logs with hollow or rotten centers.

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FIGURE 7.—This black walnut tree when sawed into log lengths should be cut at the large knot located about 10 feet from the ground.

STUMPS AND CROTCHES

Figured stumps should be grubbed in order to include all of the valuable wood (fig. 3). If the tree is felled by cutting off the roots, this will save much labor in getting the stump out of the ground. This can usually be done without damage to the stump. After the stump has been gotten out, the root spurs along the side should be cut off nearly flush with the surface of the trunk and the base squared off by sawing. Only the solid portion of the stump can be used, and the root spurs if left on the trunk will cause much inconvenience in handling and shipment. The proper method of trimming stumps is

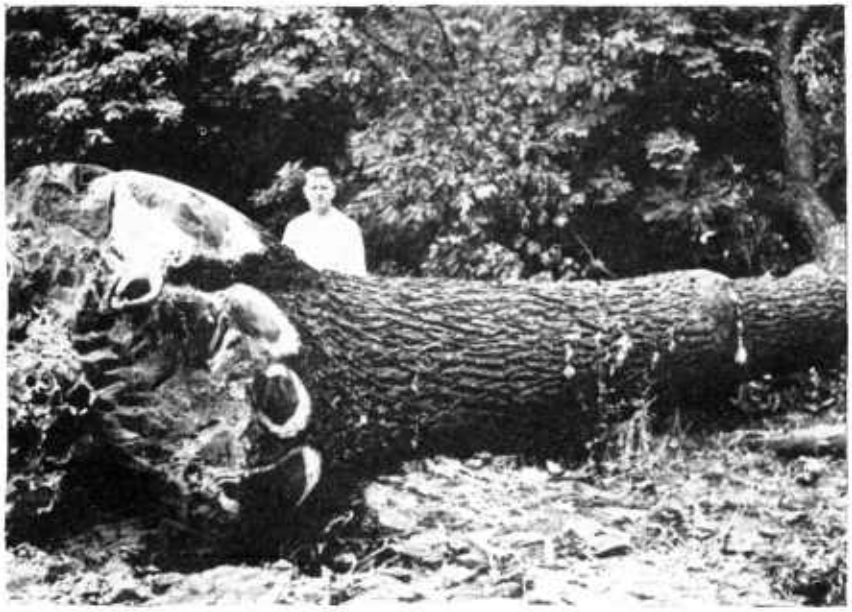

FIGURE 8.—A black walnut stump of high grade, properly trimmed of roots. Note the symmetrical bell shape of the stump (American Walnut Manufacturers' Association).

shown in figure 8. Crotches are often of special value for veneer and should be cut about the same length as stump wood, as described on page 5. The scale of walnut stumps shown in table 4 is that of the American Walnut Manufacturers' Association. Stumps smaller than 18 inches in diameter are seldom salable.

STORING CUT TIMBER

Black walnut logs should be moved to the manufacturing plant as soon as possible after cutting. They should not be left lying for a long time on the ground. If the ground is moist they should not be in contact with the earth for more than about a week. They should be raised at least 6 inches off the ground and protected as much as possible from excessive heat of the sun by being piled in the shade of trees or under a temporary shelter. Even under very good conditions, logs will stain or worms may attack them in a short time, especially during the summer months.

LOG WEIGHTS AND FREIGHT RATES

Since, as already stated, the value of black walnut timber of the same size and quality varies with the distance from the market, it is useful for the prospective seller to be able to figure the costs from the tree to the factory even though such costs can only be approximated. Transportation costs constitute a large item in marketing walnut logs, particularly if the distance is great. Table 5 gives the approximate weights of several sizes of walnut logs. These figures serve merely as a guide in determining the log weights.

In using table 5 multiply separately the total amount of timber for each diameter size (expressed in thousands of board feet) by the weight per 1,000 board feet for that diameter size. Then add the amounts for all the diameter sizes to get the total weight.

TABLE 5.—*Approximate weights of black walnut logs including bark, in green condition*

Diameter of log inside bark at small end	Weight per 1,000 board feet log scale, Doyle rule	Diameter of log inside bark at small end	Weight per 1,000 board feet log scale, Doyle rule
	Pounds		*Pounds*
12 inches	11, 900	19 inches	8, 000
13 inches	10, 900	20 inches	7, 750
14 inches	10, 200	21 inches	7, 600
15 inches	9, 500	22 inches	7, 400
16 inches	9, 000	23 inches	7, 250
17 inches	8, 600	24 inches	7, 100
18 inches	8, 300		

Following is an example of the use of the weight table:

From the list of logs (see p. 9), prepared to show the scale of each log, add together the scale of all the 12-inch diameter logs, all of the 13-inch, etc. Suppose that there are 1,500 board feet of logs measuring 12 inches at the small end. Logs of this diameter class will average about 11,900 pounds for each 1,000 board feet, Doyle scale. This would make the total weight of the 12-inch logs 17,850 pounds. By obtaining the weight in this way for each diameter size and adding all together, the total weight is obtained. This is, however, only a rough method of determining the weight, since logs of the same diameter and length will vary considerably in weight.

Ask the local railway agent the freight rate to the prospective market, then determine approximate freight cost. When the mills pay the freight, the smallest quantity acceptable as a carload is generally 4,000 board feet log scale for logs which are at least of average size and quality. A smaller quantity will be accepted by some firms if the logs are of unusually high grade or if they are figured.

A freight car will hold from 4,000 to 7,000 board feet of logs, depending mainly on the diameter size of the logs. The smaller the logs the less the quantity in board feet that the car will hold. The minimum weight set by the railroads for a shipment of logs at the rate for a carload is 40,000 pounds. The total freight charges would be the same even though the car carried a smaller load.

COST OF FELLING AND HAULING

Costs of felling black walnut and log-making depend largely on local wage scales. The farmer who harvests his own logs may not put up any cash for the work, but he should allow a fair charge for his time. If as much as a carload of logs can be cut in one place, careful planning will reduce the costs per thousand board feet.

Transporting walnut logs to the manufacturing plant is an important part of marketing. The job is usually costly because trees are far apart and logs must be hauled long distances. Rough country and poor roads make the costs go higher. Three hundred board feet of average-size logs weighs about 2,500 pounds and makes a large wagon-

load. A large motortruck will carry much more and can make more trips in a given time. A relatively short haul, good roads, and enough timber to call for the use of a large truck help to lower hauling costs. If the lumber or veneer mill is near enough so the entire haul can be made by truck, it will save the expense and trouble of loading and unloading at the railroad.

SOURCES OF ADDITIONAL INFORMATION

As previously stated, there are several possible sources from which the farmer may obtain valuable assistance in marketing his timber. The county agricultural agent, the State extension forester, and the forestry department of his State will be able to advise him how to cut and measure the timber. They may also be able to help him dispose of it advantageously. The Forest Service, United States Department of Agriculture, will furnish any available detailed information which will be helpful in marketing these timber products.

The following bulletins may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D. C., for the prices given in each case.

Farmers' Bulletins:

1210. Measuring and Marketing Farm Timber. 10 cents.
1989. Managing the Small Forest. 15 cents.

U. S. GOVERNMENT PRINTING OFFICE: 1949